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Determinants of Well-Being and Burnout Among Pediatric Residents

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ABSTRACT

Aims This study aimed to investigate the relationship between demographic factors and well-being among pediatric residents and to assess the applicability and interrelation of the Short Form Health Survey 8, Linear Analog Self-Assessment, and Maslach Burnout Inventory in evaluating resident well-being.

Instrument & Methods This cross-sectional survey was done on 88 pediatric residents at a single institution. Participants completed self-reported questionnaires, including the Short Form Health Survey 8, Linear Analog Self-Assessment, and the Maslach Burnout Inventory. Demographic data were collected, and statistical analyses, including linear regression and Spearman correlation, were conducted to identify associations between demographic variables and well-being outcomes.

Findings Residents living with family exhibited significantly higher Linear Analog Self-Assessment scores (B=1.00, 95% CI: 0.23 to 1.78, p=0.012) and lower Short Form Health Survey 8 physical and mental component scores (B=-6.50, 95% CI: -12.54 to -0.47, p=0.035, and B=-7.16, 95% CI: -14.28 to -0.04, p=0.049, respectively). Correlation analysis showed expected interrelations among the Short Form Health Survey 8, Linear Analog Self-Assessment, and Maslach Burnout Inventory scores, supporting their concurrent validity in assessing resident well-being.

Conclusion There is a significant association between living with family and improved well-being among pediatric residents.

Keywords Burnout; Medical Education; Medical Residency; Social Support; Psychological Well Being

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Introduction

The well-being of medical residents is a fundamental aspect of ensuring the delivery of optimal healthcare services [1]. Well-being encompasses the physical, mental, and emotional quality of life experienced by an individual. Studies indicate a high prevalence of well-being disturbances among residents, who often face significant symptoms of depression and reduced quality of life during their training. These issues are typically influenced by heavy workloads, academic demands, and limited rest [2, 3]. Research has consistently shown that these challenges lead to high levels of stress, fatigue, and burnout among residents. Global data reveal that a significant proportion of medical residents experience burnout [4, 5].

The challenges of resident well-being extend beyond the individual, influencing the quality of care provided to patients. Residents serve as frontline medical professionals delivering patient care, making their mental and physical health pivotal to the success of medical services [6]. Residents with poor well-being often demonstrate reduced productivity, impaired interpersonal relationships, and an increased risk of medical errors. Furthermore, poor well-being increases the likelihood of developing long-term mental health issues [7].

Identifying factors that influence resident well-being facilitates the development of more effective interventions [8]. Various factors affect residents' well-being, including demographics, such as age, gender, marital status, living arrangements, and sources of educational funding [9]. Residents living with family may benefit from better social support, enabling them to manage stress more effectively than those living alone. Financial circumstances and other underlying factors further contribute to resident burnout [10]. These elements require in-depth analysis to understand their impact on residents' overall well-being [11].

Standardized well-being instruments serve as essential tools for assessing the degree of well-being among medical residents. In recent years, a variety of validated questionnaires have been employed to measure residents' physical health, mental health, and overall quality of life [12-14]. Among these, the Short Form Health Survey 8 (SF-8), the Maslach Burnout Inventory (MBI), and the Linear Analog Self-Assessment (LASA) have demonstrated robust psychometric properties, capturing dimensions, such as emotional exhaustion, personal accomplishment, physical functioning, and life satisfaction [15, 16]. Although these tools were originally developed for broader populations, emerging evidence indicates that their scores correlate strongly with other objective indicators of resident well-being, thereby supporting their validity in this context [17, 18].

Despite numerous studies on resident well-being, few have concurrently examined how multiple objective measures interrelate [12-14, 19, 20]. Mapping the convergence and divergence of scores across the SF-8, LASA, and MBI would clarify each instrument's unique contributions and guide educators in selecting the most informative combination of measures. Furthermore, given the scarcity of such research in Indonesia, incorporating an analysis of demographic parameters could enrich the current literature. Therefore, this study aimed to explore the relationships between demographic factors and well-being in pediatric residents while evaluating the applicability and interrelationships of the SF-8, LASA, and MBI tools in a comprehensive assessment of resident well-being.

Instrument and Methods

Study design and participants

This cross-sectional study involving pediatric residents was conducted in March 2025 at the Dr. Soetomo General Academic Hospital in Surabaya, Indonesia. Ethical clearance was obtained from the Institutional Review Board of Dr. Soetomo General Academic Hospital (Protocol Number 1232/KEPK/II/2025). The study was carried out in accordance with the principles of the Declaration of Helsinki. Eligible participants included all pediatric residents who provided informed consent. Residents who had not completed the required surveys were excluded from the study.

Sample size calculation

The minimum sample size was estimated using the standard formula for multiple regression. The minimum required sample size for our study was 81 residents.

$$n = \frac{\left(Z_{1-\alpha/2} + Z_{1-\beta}\right)^2}{f^2} + k + 1$$

k=Number of predictors (10)
α=Two-sided significance level (0.05)
1-β=Power (0.80)
f^2=Cohen's convention for multiple regression (medium effect size 0.15)

Assessment tools

The SF-8 is a shortened version of the SF-36. Its primary goal is to provide an efficient tool for assessing mental and physical health status, particularly in large-scale population surveys and clinical studies where time is constrained [21]. The SF-8 evaluates eight health domains, including physical functioning, pain, vitality, and mental health. It provides two components, including the Physical Component Summary (PCS) and the Mental Component Summary (MCS). The SF-8 has been extensively validated, showing a high correlation with the SF-36, making it a reliable tool for quality-of-life assessment [21-23].

The LASA was introduced as a straightforward tool for evaluating individuals' perceptions of well-being

across various dimensions. Its objective is to offer a quick, practical, and comprehensible approach for assessing physical health, emotional well-being, and overall quality of life. The tool is particularly useful in clinical settings with limited time for patient evaluation [24]. The LASA uses a visual scale from 0 (representing the worst condition) to 10 (representing the best condition). Its reliability has been validated through multiple studies, demonstrating high sensitivity in capturing minor changes in individuals' perceptions of well-being [24, 25].

The MBI was developed by Christina Maslach and Susan E. Jackson in 1981 as a comprehensive tool for assessing burnout [26]. It measures three key dimensions, including emotional exhaustion (MBI-EE), depersonalization (MBI-DP), and personal accomplishment (MBI-PA). Higher scores on the MBI-EE and MBI-DP reflect higher levels of burnout, while lower scores on the MBI-PA indicate reduced job satisfaction. The MBI is frequently used to assess how workload impacts burnout [27, 28]. Studies have found strong correlations between MBI scores and other instruments that assess quality of life in residents [29].

Data collection

Participants completed demographic data and three validated tools to assess well-being and burnout levels. The collected data included gender, age, living arrangements, professional level (junior ≤3 semesters), prior work experience before residency (hospital or primary care), previous private practice experience, undergraduate medical education background (alumnus of Universitas Airlangga or not), presence of a partner (married), presence of children, and whether the partner was employed (indicating shared financial responsibilities). All responses were anonymized using unique participant IDs to ensure confidentiality. Informed consent was obtained prior to data collection.

The SF-8 consists of eight items answered on 5- or 6-point Likert scales, which are converted to 0-100 norm-based scores to yield two summary measures: the PCS and the MCS [30]. The LASA comprises five single-item well-being domains (physical, emotional, social, intellectual, and overall quality of life), each rated on a 0-10 visual analog scale, with the overall LASA score calculated as the mean of these items [31]. The MBI used was the Maslach Burnout Inventory-Human Services Survey (MBI-HSS), which contains 22 items across three subscales: MBI-EE (9 items), MBI-DP (5 items), and MBI-PA (8 items) [26]. Each item is rated from 0 (never) to 6 (every day). The content validity of each questionnaire was thoroughly assessed by experts prior to its distribution.

Statistical analysis

Linear regression analysis was conducted to measure the impact of independent parameters on each outcome. To evaluate the associations among well-being and burnout measures, Spearman's correlation coefficients were calculated. A significance level of $p<0.05$ was set for all analyses, which were performed using SPSS 23.

Findings

The study included 88 medical residents, predominantly female (70.5%), with a majority being over 30 years old (61.4%). Most participants were married (77.3%), had children (60.2%), and lived with family members (55.7%). Regarding training status, 61.4% were classified as senior residents, while 38.6% were junior residents. Prior to residency, 71.6% had work experience in hospital settings, and 69.3% had engaged in private practice. Nearly half (45.5%) were alumni of Universitas Airlangga, having completed their undergraduate medical education there. Additionally, 59.1% reported that their partners were employed, indicating shared financial responsibilities (Table 1).

Table 1. Demographic characteristics and outcomes of study participants

Parameter	Values
Age	
>30 years	54(61.4)
≤30 years	34(38.6)
Sex	
Male	26(29.5)
Female	62(70.5)
Professional level	
Senior	54(61.4)
Junior	34(38.6)
Work experience	
Hospital	63(71.6)
Primary facility	25(28.4)
Prior private practice	61(69.3)
Alumnus of Universitas Airlangga (medical doctor)	40(45.5)
Living status	
Has a partner (married)	68(77.3)
Has children	53(60.2)
Partner employed	52(59.1)
Living with family	49(55.7)
Assessments (median (IQR))	
SF-8 PCS (0-100)	52.5(45.0-60.0)
SF-8 MCS (0-100)	50.0(40.0-60.0)
LASA (0-10)	7.0(6.0-7.8)
MBI-EE (0-54)	17.0(8.0-23.0)
MBI-DP (0-30)	4.0(2.0-7.0)
MBI-PA (0-48)	29.0(24.0-35.8)

DP: Depersonalization; EE: Emotional Exhaustion; LASA: Linear Analog Self-Assessment; MBI: Maslach Burnout Inventory; MCS: Mental Component Score; PA: Personal Accomplishment; PCS: Physical Component Score

Well-being and burnout assessments revealed a median SF-8 PCS score of 52.5 (IQR: 45.0-60.0) and a MCS score of 50.0 (IQR: 40.0-60.0). The median LASA score was 7.0 (IQR: 6.0-7.8). For burnout measures, median scores were 17.0 (IQR: 8.0-23.0) for emotional exhaustion (MBI-EE), 4.0 (IQR: 2.0-7.0) for depersonalization (MBI-DP), and 29.0 (IQR: 24.0-35.8) for personal accomplishment (MBI-PA).

In the linear regression analysis (Table 2), living with family was significantly associated with lower scores on both the SF-8 PCS (PCS; B=-6.50; 95% CI: -12.54 to -0.47; p=0.035) and the MCS (B=-7.16; 95% CI: -14.28

to -0.04; p=0.049). Additionally, living with family was positively associated with higher LASA scores (B=1.00; 95% CI: 0.23 to 1.78; p=0.012), suggesting better overall well-being in this group. No other demographic parameters showed statistically significant associations with SF-8, LASA, or MBI outcomes.

Spearman correlation analysis indicated significant associations among well-being and burnout measures. The SF-8 PCS and MCS scores were positively correlated (r=0.599, p<0.01). Both PCS and MCS scores were negatively correlated with LASA scores (r=-0.644 and r=-0.797, respectively; p<0.01). Regarding burnout dimensions, MBI-EE and MBI-DP showed positive correlations with PCS and MCS, as well as a negative correlation with LASA scores. MBI-PA was negatively correlated with PCS and MCS and positively correlated with LASA scores (Table 3).

Table 2. Linear Regression Model for SF-8 and LASA Scores

Predictor	B (95% CI)	SE	β	t	p-value
SF-8 PCS					
Male	0.83(-5.47, 7.12)	3.16	0.03	0.26	0.795
Senior	1.10(-6.05, 8.25)	3.59	0.04	0.31	0.761
Alumnus of Universitas Airlangga	0.66(-5.36, 6.67)	3.02	0.03	0.22	0.829
Employed in a hospital	-1.75(-8.15, 4.65)	3.22	-0.06	-0.55	0.588
Private practice	6.41(-0.04, 12.86)	3.24	0.23	1.98	0.051
Age >30 years	3.87(-3.73, 11.47)	3.82	0.15	1.01	0.314
Has partner	-6.55(-16.92, 3.82)	5.21	-0.22	-1.26	0.212
Has children	4.76(-3.01, 12.54)	3.90	0.18	1.22	0.226
Partner employed	-0.33(-7.63, 6.96)	3.66	-0.01	-0.09	0.928
Living with family	-6.50(-12.54, -0.47)	3.03	-0.26	-2.15	0.035*
SF-8 MCS					
Male	-0.06(-7.49, 7.36)	3.73	0.00	-0.02	0.986
Senior	3.19(-5.24, 11.62)	4.23	0.10	0.75	0.453
Alumnus of Universitas Airlangga	-4.33(-11.43, 2.77)	3.56	-0.14	-1.22	0.228
Employed in a hospital	5.45(-2.09, 13.00)	3.79	0.16	1.44	0.154
Private practice	4.83(-2.78, 12.43)	3.82	0.15	1.26	0.210
Age >30 years	-3.79(-12.76, 5.17)	4.50	-0.12	-0.84	0.402
Has partner	-7.75(-19.98, 4.48)	6.14	-0.21	-1.26	0.211
Has children	0.68(-8.49, 9.84)	4.60	0.02	0.15	0.883
Partner employed	-1.23(-9.83, 7.37)	4.32	-0.04	-0.29	0.776
Living with family	-7.16(-14.28, -0.04)	3.58	-0.23	-2.00	0.049*
LASA					
Male	-0.22(-1.03, 0.59)	0.41	-0.06	-0.54	0.592
Senior	-0.07(-0.99, 0.85)	0.46	-0.02	-0.16	0.876
Alumnus of Universitas Airlangga	0.11(-0.66, 0.89)	0.39	0.03	0.29	0.774
Employed in a hospital	-0.26(-1.08, 0.57)	0.41	-0.07	-0.62	0.538
Private practice	-0.76(-1.59, 0.06)	0.42	-0.21	-1.84	0.070
Age >30 years	-0.05(-1.03, 0.92)	0.49	-0.02	-0.11	0.914
Has partner	1.02(-0.31, 2.35)	0.67	0.26	1.52	0.132
Has children	0.00(-0.99, 1.00)	0.50	0.00	0.01	0.993
Partner employed	-0.22(-1.16, 0.72)	0.47	-0.07	-0.47	0.639
Living with family	1.00(0.23, 1.78)	0.39	0.30	2.57	0.012*

* p-value<0.05; 95% CI: 95% Confidence Interval; LASA: Linear Analog Self-Assessment; MCS: Mental Component Score; PCS: Physical Component Score; SE: Standard Error

Table 3. The correlation of SF-8, LASA, and MBI

Parameter	MBI-PA	MBI-DP	MBI-EE	LASA	MCS	PCS
PCS	-0.296*	0.304*	0.502**	-0.644**	0.599**	-
MCS	-0.379**	0.409**	0.703**	-0.797**	-	
LASA	0.459**	-0.398**	-0.745**	-		
MBI-EE	-0.425**	0.589**	-			
MBI-DP	-0.463**	-				
MBI-PA	-					

* p-value<0.05; ** p-value<0.001; DP: Depersonalization; EE: Emotional Exhaustion; LASA: Linear Analog Self-Assessment; MBI: Maslach Burnout Inventory; MCS: Mental Component Summary; PA: Personal Accomplishment; PCS: Physical Component Summary

Discussion

This study aimed to explore the relationships between demographic factors and well-being in pediatric residents. Burnout is a condition characterized by physical, emotional, and mental exhaustion, often resulting from high workload and chronic stress [32]. It is typically reflected in severe emotional fatigue, a detached attitude, and a weakened sense of personal efficacy [33]. Burnout can impair residents' ability to provide optimal care, affecting clinical decision-making, reducing empathy toward patients, and increasing the risk of medical errors. Addressing resident burnout is important for improving their health and healthcare delivery [34]. If left unaddressed, burnout can jeopardize residents' career sustainability and overall quality of life [35, 36].

In terms of burnout, our study on pediatric residents reported substantially lower EE and DP but also

lower PA compared with U.S. medical students (EE 24.4, DP 8.0, PA 36.0) and Korean interns (combined EE 37.1, DP 17.5, PA 33.4) [19, 37]. The SF-8 score in this study closely mirrors U.S. figures for PCS (52.6) but exceeds the U.S. MCS score (43.8) [37]. The average LASA score in our study surpassed that of U.S. internal medicine trainees (6.54) and Korean interns (4.9) [13, 19]. Comparative data indicate that healthcare professionals in Western contexts exhibit higher burnout levels than their Eastern counterparts. Fish *et al.* [38] found that Australian nurses report significantly greater emotional exhaustion and depersonalization than Chinese nurses, despite identical job demands. These findings suggest that Western practitioners may be more vulnerable to burnout compared to those in collectivist societies.

Higher overall quality-of-life scores (LASA) likely reflect socio-cultural influences on quality of life. Within a diverse urban Asian population in Singapore, family support and better housing independently improved SF-36 scores by 3.5-4.0 points, while ethnicity and socio-economic status together accounted for mean differences of 1.4-13.1 points across domains [39]. Such gains exceed the 5-point threshold for a minimum clinically important difference, underscoring how strong familial bonds and a cultural emphasis on collective well-being can buffer stress and enhance resilience among residents, with less pronounced effects in Western training environments.

Burnout prevalence among Chinese doctors appears especially pronounced in tertiary hospitals, such as our study settings. Lo *et al.*'s systematic review has revealed overall burnout rates of 66.5-87.8% in Mainland China, with the highest risk observed among physicians working over 40 hours per week in tertiary care centers [40]. The combination of intense workloads, high patient volumes, and limited primary care infrastructure likely exacerbates stress and diminishes opportunities for humanistic patient-physician interactions in these settings. However, despite differences in resident ethnicity, specialty, or training location, the MBI has demonstrated robust psychometric properties across diverse populations [41].

Living with family was found to be significantly associated with lower PCS, lower MCS, and higher LASA scores, reflecting better perceived well-being among these residents. This finding underscores the importance of family support in enhancing mental health during residency training [42]. Family members may provide critical emotional encouragement, logistical assistance, and a stable environment, all of which contribute to reducing stress and improving coping mechanisms.

The ability to share daily challenges and receive support from groups likely alleviates feelings of anxiety and depressive symptoms, which are common in high-stress professional settings like residency [42, 43].

Several limitations exist in this study. First, this research does not establish causality or track changes over time. Longitudinal studies are needed to explore the dynamics of well-being and burnout throughout residency. Second, the reliance on self-administered questionnaires introduces the potential for bias, including social desirability bias [44]. Third, this study lacks burnout categorization into low, moderate, or high levels. This decision was made due to the absence of validated cutoff points for the MBI specific to Southeast Asian populations, especially Indonesia. Therefore, to avoid potential misclassification, we opted to analyze burnout scores as continuous variables rather than categorizing them into arbitrary levels.

Future research should incorporate objective assessments alongside self-reported data, as this could offer deeper insights. It is necessary to explore family functioning in greater depth rather than merely considering living arrangements. Previous studies suggest that family dynamics do not always directly influence psychological outcomes; complex factors may moderate the relationship between family support and individual well-being [45]. Future studies also need to assess cultural differences, interactions with other residents, and the mental resilience of the residents, as these factors may vary across different settings [46].

This study underscores the significant association between living with family and improved well-being among pediatric residents. Residents cohabiting with family members reported higher LASA scores and lower SF-8 physical and mental component scores, indicating enhanced overall well-being. While the specific mechanisms of familial support were not explored in detail, these findings suggest that such living arrangements may provide emotional and logistical support that mitigates stress during residency. Additionally, the observed correlations among SF-8, LASA, and MBI scores align with the theoretical constructs of these instruments, reinforcing their validity in assessing the well-being of pediatric residents. These results suggest that these tools can be effectively utilized to monitor and address well-being in this population.

Conclusion

There is a significant association between living with family and improved well-being among pediatric residents.

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